What is claimed:

1. A method of making a device comprising the steps of:

(a) depositing a dielectric thin film mask material on a semiconductor substrate surface;

(b) patterning the mask material to form openings therein extending to the substrate surface;

(c) growing active material in the openings;

(d) removing the mask material to form the device with reduced extended defect density; and

(e) depositing electrical contacts on the device.

2. The method of claim 1 including the step of cleaning the exposed substrate surface to make it ready for epitaxial deposition of the active material.

3. The method of claim 2 including the step of depositing a resist material on the substrate surface before depositing the mask material; developing the resist material and removing and the mask material to create the openings where the active material is grown.

4. The method of claim 1 including the step of doping the active material.

5. The method of claim 1 including the steps of depositing a resist material on the mask material and developing the resist material, said patterning step including removal of the mask material and the resist material to create the openings.

6. The method of claim 1 wherein open area on the substrate surface is in the approximate range of 1 % to 99 %.

7. The method of claim 2 wherein the substrate surface includes a thin film of a starting material.

8. The method of claim 7 wherein the starting material is the active material.

9. The method of claim 3 including the step of cleaning the substrate surface coated with the resist material and the mask material.

10. The method of claim 1 wherein the substrate surface is a thin film of the active material to allow for growth of the active material thereon.

11. The method of claim 6 wherein growth of the active material in the openings is at a rate of approximately 1 μm/hr to 30 μm/hr.

12. The method of claim 2 wherein thickness of the deposited mask material is in the approximate range of 1000 Å to 2000 Å.

13. The method of claim 2 wherein the substrate surface is selected from the group consisting of sapphire, diamond, silicon carbide, lithium aluminate, and lithium gallate; the mask material is selected from the group consisting of silicon dioxide and silicon nitride; and the active material is selected from the group consisting of gallium nitride, aluminum gallium nitride and indium gallium nitride.

14. The method of claim 2 wherein the resist is selected from positive, negative and mixtures of the resists .

15. A device having reduced extended defect density comprising a substrate, a semiconductor active material deposited on said substrateand having atomically smooth surfaces, and electrical contacts on said device.

16. Device of claim 15 wherein said substrate is selected from the group consisting of sapphire,

diamond, silicon carbide, lithium aluminate, and lithium gallate; and said active material is selected from the group consisting of nitrides that have a tunable direct bandgap in the approximate range of 0.8 eV to 6.2 eV.

17. Device of claim 15 wherein said active material is selected from the group consisting of gallium nitride, aluminum gallium nitride and indium gallium nitride.

18. Device of claim 15 that can operate at frequency in the approximate range of 1 GHz to 100 GHz and power in the approximate rang of 2 W/mm of gate periphery to 10 W/mm of gate periphery, wherein said substrate is selected from the group consisting of sapphire and silicon carbide and said active material is selected from the group consisting of gallium nitride, aluminum gallium nitride and indium gallium nitride.

19. Device of claim 15 that has reverse bias leakage current below $1x10^{-9}$ amps wherein said substrate is selected from the group consisting of sapphire and silicon carbide and said active material is selected from the group consisting of gallium nitride, aluminum gallium nitride and indium gallium nitride.

20. Device of claim 19 wherein said electrical contacts are selected from suitable metallic materials.